

BUTTERFLIES AND MOTHS

Hampshire Biodiversity Partnership

1 INTRODUCTION

One of the main objectives of the *Biodiversity Action Plan for Hampshire* is the production of Species Action Plans for priority species. This Plan covers priority species of butterflies and moths. It reviews the current status of these species, factors affecting their past and present status, and recommendations for future action. This Action Plan is intended to complement, not duplicate, Hampshire Habitat Action Plans (HAPs). It identifies important habitats for each priority butterfly and moth species and makes cross-reference to appropriate HAPs that should be read in tandem with this Plan.

The main aims of this Species Action Plan are:

- to identify butterflies and moths most at risk in the county;
- to outline the site and management requirements of these species;
- to identify the most important areas and sites for butterflies and moths in the county; and
- to set out priority action required, including site and species protection and management, research, survey and monitoring.

**SPECIES
ACTION
PLAN**

The Plan is divided into three sections: Butterflies (Section 2), Macro-moths (Section 3) and Micro-moths (Section 4).

The relationship between priority butterflies and moths and habitats in Hampshire is summarised in Table 1. Broadleaf woodland and calcareous grassland are the two most favoured habitats while arable land is the most barren.

Table 1 Habitats favoured by Hampshire butterfly and moth priority species (%)

	Butterflies	Macro-moths	Micro-moths	All Lepidoptera
Broadleaf woodland	19.6	31.1	32.8	28.5
Coniferous woodland	0.0	0.0	3.0	1.3
Calcareous grassland	23.9	22.2	16.4	20.3
Neutral dry grassland	8.7	4.4	6.0	6.3
Wet grassland/marshes	4.3	2.2	17.9	9.5
Heathland/acid grassland/bog	8.7	15.6	3.0	8.2
Coastal	15.2	4.4	13.4	11.4
Hedgerows	4.3	6.7	0.0	3.2
Arable land	0.0	2.2	0.0	0.6
Road verges	2.2	2.2	0.0	1.3
Urban	2.2	2.2	4.5	3.2
Waste places	10.9	6.7	3.0	6.3

2 BUTTERFLIES

2.1 Selection of Priority Species

This Plan covers the following regionally high and medium priority butterfly species resident in Hampshire:

High Priority Species

adonis blue *Lysandra bellargus*
brown hairstreak *Thecla betulae*
Duke of Burgundy fritillary *Hamearis lucina*
Glanville fritillary *Melitaea cinxia*
grizzled skipper *Pyrgus malvae*

marsh fritillary *Eurodryas aurinia*
pearl-bordered fritillary *Boloria euphrosyne*
purple emperor *Apatura iris*
silver-spotted skipper *Hesperia comma*
silver-studded blue *Plebejus argus*
small blue *Cupido minimus*
small pearl-bordered fritillary *Boloria selene*

Medium Priority Species

chalkhill blue *Lysandra coridon*
dingy skipper *Erynnis tages*
grayling *Hipparchia semele*
wall *Lasiommata megera*
white admiral *Ladoga camilla*
white-letter hairstreak *Satyrium W-album*

The selection of Hampshire's priority butterfly species is based on Butterfly Conservation's national¹ and regional² priority lists. Priority status has been determined on the basis of recent national and regional population trends. Regional medium priority species are included as they have shown a recent decline in population numbers in some areas of Hampshire.

2.2 Current Status

The Millennium Atlas Project³, published in 2001, gives a comprehensive record of population changes and distribution of all British butterflies. In addition, the book summarises details of ecological research and conservation management of butterflies and draws heavily upon the dataset of the Butterfly Monitoring Scheme (BMS). Additional information on high priority butterflies is covered in Butterfly Conservation's Species Actions Plans⁷⁻¹⁹. The distribution, population trends and other ecological and management details of butterflies in Hampshire, including medium priority species and emphasising records from the last decade, are comprehensively covered in *The Butterflies of Hampshire*⁴. Earlier records of butterflies and moths in Hampshire may be found in *The Butterflies & Moths of Hampshire and the Isle of Wight*^{5,6}.

For each butterfly species outlined below, comments given with regard to protection refer to legal protection: It is illegal (without a license) to disturb or harm any species that is listed in the Wildlife & Countryside Act 1981 as "fully protected"; It is illegal to sell or advertise the sale (without a license) of any species that is listed in the Wildlife & Countryside Act 1981 as "for sale only".

High Priority Butterflies

Adonis blue

The adonis blue is restricted to south-facing chalk and limestone downs and coastal cliff tops of southern England where its foodplant, horseshoe vetch *Hippocrepis comosa*, grows in short vegetation. The short sward provides a very warm microclimate necessary for larval development that includes a strong mutualism between attending ants (usually *Myrmica sabuleti* or *Lasius alienus*) and larvae and pupae. Larvae feed on the plant while being attended by the ants 24 hours a day. The pupa stage lasts for about 3 weeks, usually in the upper chambers of the ant nest.

In Britain the adonis blue is confined to the southern counties of Dorset (50% of UK resource), Wiltshire, Hampshire, Kent, Sussex, Surrey, the Isle of Wight and one site in the Chilterns. Martin Down NNR is

the only site currently supporting this species in Hampshire.

Flight: mid-May to mid-June and mid-August to mid-September.

Protection: Wildlife & Countryside Act 1981, for sale only.

Brown hairstreak

The brown hairstreak occurs in regions with extensive networks of hedgerows and woodland edges where the normal larval foodplant, blackthorn *Prunus spinosa*, grows abundantly.

The butterfly has declined in Britain over the last 25 years by 25-50 %. The brown hairstreak is now extinct in most of the midlands and eastern England. At present, the remaining strongholds are in the wooded clays of the west Weald in Sussex and Surrey, the low-lying valleys and copses of north Devon and south-west Somerset, and the low-lying pastoral areas of south-west Wales. The brown hairstreak is one of the region's rarest species, occurring in only 4 to 6 scattered populations in Dorset, Wiltshire and Hampshire.

The brown hairstreak is probably under-recorded but only two established populations in Hampshire are known: at Selborne (Noar Hill), and in an area south-west of Andover (Shipton Bellinger-Cholderton) where it is thinly scattered over a large area of mixed scrub and blackthorn hedges.

Flight: late July to mid-September.

Protection: Wildlife & Countryside Act 1981, for sale only.

Duke of Burgundy fritillary

The Duke of Burgundy occurs on calcareous grassland, in coppice woodland and woods with wide rides and areas of grassland. The usual larval foodplant is primrose *Primula vulgaris* in woodland, and cowslip *P. veris* on chalk and limestone.

The Duke of Burgundy has declined in Britain since the 1950s. Most colonies are now restricted to chalk downland in Wiltshire, Hampshire and the western South Downs in Sussex, and unimproved limestone grassland in the Cotswolds.

Most Duke of Burgundy colonies in Hampshire are small and woodland colonies are few and often short lived due to inadequate management and conflicting priorities. The largest populations occur at Noar Hill in Newton Valence, The Mountain in West Meon, and Porton Down.

Flight: early May to mid-June.

Protection: Wildlife & Countryside Act 1981, for sale only.

Glanville fritillary

The Glanville fritillary occurs on coastal sandy undercliffs where the main larval foodplant ribwort plantain *Plantago lanceolata* grows.

In Britain the butterfly is restricted to the south coast of the Isle of Wight and, since 1990, a single colony on the Hampshire coast.

Flight: late May to June.

Protection: Wildlife & Countryside Act 1981, for sale only.

Grizzled skipper

The grizzled skipper is usually found in extensive stretches of calcareous grassland, woodland clearings, quarries, disused railway lines and coastal areas where the butterfly uses a wide range of *rosaceae* larval foodplants such as agrimony, creeping cinquefoil, tormentil and wild strawberry.

Britain has shown a 25-50% decline of populations over the last 25 years. Locally common in central and southern England, the main strongholds are the counties of Dorset, Somerset, Hampshire and Wiltshire.

In Hampshire the grizzled skipper is spread widely over the central chalk grasslands with a scattering of small colonies in woodland clearings and other areas of the county (about 80 colonies in 1999). The larger colonies are normally found at the calcareous grassland sites of Butser Hill and Martin Down, in addition to the woodland site of Botley Wood. Hampshire, Dorset and Wiltshire hold about 35 % of the total UK resource.

Flight: late April to early-July.

Protection: none.

Marsh fritillary

The marsh fritillary is found in damp, neutral or acid grasslands and dry calcareous grassland. Its main larval host plant is devil's bit scabious *Succisa pratensis*.

The marsh fritillary was once widely distributed throughout the UK but has declined considerably over the last 150 years. Current strongholds are in the Culm grasslands of north Devon and Cornwall, the chalk grasslands of Salisbury Plain, south Wales and a few remaining sites in west

Scotland and Cumberland. Colonies are estimated to be disappearing at a rate of well over 10% per decade. Bentley Wood and Martin Down, both on the western border with Wiltshire, are the last remaining Hampshire sites where the butterfly may be seen in small numbers.

Flight: mid-May to late June.

Protection: fully protected in Great Britain and Northern Ireland.

Pearl-bordered and small pearl-bordered fritillaries

These two species are found in clearings and rides in woodland in central-southern England, especially deciduous woodland that has a continuous history of coppice or underwood management producing continuous open spaces. Both species may be found in the same location feeding on violets, usually the common dog violet *Viola riviana*, although the small pearl-bordered fritillary prefers a damper habitat.

Both fritillaries have declined rapidly in the UK over the last 50 years. Presently, the best sites for small pearl-bordered fritillary are Pamber Forest and Bentley Wood. Small populations of pearl-bordered fritillary are found in the New Forest (Pignal and Ramnor Inclosures), a few privately owned woods near Romsey and Stockbridge, Bentley Wood, and Porton Down.

Flight: normally May to June with small pearl-bordered peaking 1-2 weeks later than pearl-bordered, although earlier emergence in April has occurred in warm springs.

Protection: pearl-bordered fritillary - Wildlife & Countryside Act 1981, for sale only; small pearl-bordered fritillary - none.

Purple emperor

The purple emperor is usually found in large forests or in copses that lie between larger woods containing a large deciduous component. Goat willow (or broad-leaved sallow) *Salix caprea*, is the most widely used foodplant.

The butterfly was widely distributed throughout England and Wales but over the last 50 years its range has contracted to core areas of central-southern England such as Surrey, Sussex, Hampshire and south Wiltshire.

The purple emperor is scattered throughout Hampshire in the larger broad-leaved forests with the exception of the New Forest and other areas of densely coniferised woodland. Favoured sites are Bentley Wood, Pamber Forest, Botley Wood, Butterwood and



Creech Wood. The strong Alice Holt Forest colony, stable for many years in the 1930-80 period, has suffered a drastic decline over the last decade.

Flight: late June to mid-August.

Protection: Wildlife & Countryside Act 1981, for sale only.

Silver-spotted skipper

In Britain, the silver-spotted skipper is restricted to calcareous grassland where larvae feed solely on sheep's fescue grass *Festuca ovina*. Most sites occur on steep, south facing slopes with thin soils.

The silver-spotted skipper was formerly very widely distributed but local on calcareous soils from southern and eastern England up to Yorkshire. Its range declined considerably in the 20th century, although a slight expansion has occurred in formerly occupied areas during the last few years. It is now found mainly in the South Downs and a small area of the North Downs.

In Hampshire calcareous grassland and bordering areas account for about 30% of the total UK population of silver-spotted skipper. Two of the existing Meon Valley sites have been naturally colonised during the last 20 years. Major sites are Porton Down, Broughton Down, Old Winchester Hill and Beacon Hill (Warnford).

Flight: late July to early September.

Protection: Wildlife & Countryside Act 1981, for sale only.

Silver-studded blue

The silver-studded blue occurs in a variety of habitats from acid heathland (dry and wet) to calcareous grassland, sand-dunes and lowland mosses. This species favours flat or gently sloping land, a warm microclimate, heathers in the pioneer stage, a continuous supply of pioneer heathland, varied age structure of flight area and the correct species of ant. Larvae have a strong relationship with ants (*Lasius spp.*) and pupate within or close to ant nests.

In Britain the butterfly was historically found in all areas including Scotland but suffered a drastic decline in the last century and is now only commonly found on acid heathland in the southern counties of Dorset and Hampshire. Here the populations contain 35% to 40% of the total UK resource.

In Hampshire the larger colonies during the last few years have been recorded at Pig Bush, Fair Cross Heath and Rowbarrow in

the New Forest, Broxhead Common in the east and Yateley Common in the north-east.

Flight: late June to early September.

Protection: Wildlife & Countryside Act 1981, for sale only.

Small blue

The small blue butterfly breeds in a range of dry sheltered grasslands where its sole foodplant kidney vetch *Anthyllis vulneraria* grows. These grasslands include chalk and limestone grassland, coastal grassland and dunes, and man-made habitats such as quarries, road embankments and disused railway tracks.

There has been a decline of 25 to 50% in the UK over the last two decades. The small blue occurs very locally throughout Britain and Ireland, the main centres of distribution being chalk and limestone grasslands of the Cotswolds and downland on Salisbury Plain. Populations have declined in southern England leaving scattered colonies in Dorset, Surrey, Gloucestershire and Hampshire.

The butterfly is found in the Meon Valley, a cluster of small populations in the Winchester area, and at a few sites in west and north-west Hampshire.

Flight: May to August.

Protection: Wildlife & Countryside Act 1981, for sale only.

Medium Priority Butterflies

Chalkhill blue

The chalkhill blue occurs on calcareous grassland and prefers south- and west-facing slopes of downland where its sole foodplant horseshoe vetch *Hippocrepis comosa* grows in shorter turf.

In Britain colonies occur mainly on the calcareous grassland of the North and South Downs, the Chilterns, the Cotswolds and the downland of Wiltshire, Hampshire, Dorset and the Isle of Wight.

The chalkhill blue is widespread and locally common on calcareous grassland in western and central Hampshire. Some of the most important sites include Beacon Hill (Warnford), Broughton Down, Farley Mount, Magdalen Hill Down, Martin Down, Old Winchester Hill, Stockbridge Down and St. Catherine's Hill.

Flight: late June to mid-September.

Protection: Wildlife & Countryside Act 1981, for sale only.

Dingy skipper

The dingy skipper occurs in a wide range of open, sunny habitats including chalk downland, woodland rides and clearings, coastal habitats such as dunes and undercliffs, heathland, old quarries, railway lines, and waste ground. Common bird's-foot trefoil *Lotus corniculatus* is the usual foodplant in most habitats, but horseshoe vetch is sometimes used on calcareous soils, and greater bird's-foot trefoil on heavy soils.

The butterfly occurs widely throughout Britain and Ireland. Stronghold areas are found mainly on chalk downland and undercliff in central and southern areas of England (Wiltshire, Hampshire, Surrey and Sussex). However, colonies in woodland and other habitats are declining in general.

The largest colonies are found on calcareous grassland sites such as Noar Hill, Pitt Down (Farley Mount Country Park), Beacon Hill (Warnford), The Mountain, and the Downs of Oxenbourne, Martin and Broughton.

Flight: early May to late June.

Protection: protected in Northern Ireland.

Grayling

The grayling occurs in many dry and well-drained habitats ranging from coastal areas (dunes, saltmarsh, undercliffs and clifftops) to heathland, calcareous grassland, wasteland and open woodland. Sheep's fescue *Festuca ovina*, red fescue *Festuca rubra*, bristle bent *Agrostis curtisii*, and early hair-grass *Aira praecox* are normally used for egg laying.

The butterfly is a widespread coastal species in Britain and Ireland, although absent from parts of the north-east coast of England. The main inland colonies in England occur on dry lowland heaths in Dorset, Hampshire, Surrey and the Breckland of East Anglia. There has been a decline of about 40% in numbers during the last two decades in southern England.

In Hampshire New Forest heathland is the major stronghold with the north-eastern heaths holding several colonies. The butterfly is almost absent from central chalk areas apart from Porton Down. Important coastal colonies are found between Southampton and the Sussex border at Hamble Common, Browdown and Sandy Point.

Flight: early-July to mid-September.

Protection: none.

Wall

The wall occurs in short, open arid grassland where the turf is broken, or on stony bare ground. It is found in dunes and other coastal habitats, as well as disturbed land, quarries and waste places. A range of grasses are used by larvae such as tor-grass *Brachypodium pinnatum*, false brome *B. sylvaticum*, cock's-foot *Dactylis glomerata*, wavy hair-grass *Deschampsia flexuosa* and Yorkshire fog *Holcus lanatus*.

The wall is widespread in Britain and Ireland apart from highland Scotland. In Hampshire, the wall is largely confined to coastal areas such as Farlington Marshes, Hook-with-Warsash, Needs Ore, Pennington Marshes and Portsdown Hill. Overall, there has been a steady decline of about 50% in Hampshire during the last two decades.

Flight: May to mid-September.

Protection: none.

White admiral

The white admiral²⁰ occurs in woodland where its sole foodplant, wild honeysuckle *Lonicera periclymenum*, grows in shade but close to sunny rides and glades. It is found in both deciduous and mixed deciduous/coniferous woodland. Adults need sunny rides for courtship and access to their favourite nectar source, bramble.

In Britain, the butterfly is mainly found in central southern England although there has been a recent expansion into areas of East Anglia, West Midlands and eastern Wales.

The white admiral is widespread throughout Hampshire, mainly in deciduous woodland dominated by oaks on acid or neutral soils. Pamber Forest has been one of the best woods for this species over the last 20 years. Large populations also occur in Botley Wood, Crab Wood and Harewood Forest.

Flight: late June to mid-August.

Protection: none.

White-letter hairstreak

The white-letter hairstreak²¹ occurs where elms occur in sheltered hedgerows, mixed scrub and the edges of woodland rides and parkland. The larval foodplant covers a range of elm species but in Hampshire wych elm *Ulmus glabra* is strongly favoured. Thistles and bramble flowers are known to be well-favoured nectar sources.



In Britain, it is mainly distributed locally across lowland southern and central areas of England, in Yorkshire, and into north and south Wales.

The white-letter hairstreak is widespread in Hampshire where elms are frequent. Important colonies occur in urban areas like Southampton, Portsmouth, Winchester and Basingstoke. The East Hampshire Hangers have been a county stronghold since the 1970s, with Ashford Hangers and Stoney Hill also holding high concentrations of the butterfly.

Flight: early July to mid-August.

Protection: Wildlife & Countryside Act 1981, for sale only.

Urban (disused quarries, gardens, railway embankments, cuttings)
chalkhill blue, dingy skipper, grizzled skipper, small blue, wall

2.3 Current Factors Affecting Priority Butterfly Species

During the last 50 years changes in the British landscape have resulted in the destruction and fragmentation of butterfly and moth habitats. At the same time, many remaining pockets of suitable habitat have deteriorated from adverse woodland and agricultural grassland management policies. For instance agricultural intensification of unimproved grassland has resulted in the decline of several butterfly species. The use of chemicals and the loss of herbaceous rich field margins have all contributed to the decline of many butterflies.

Changes in woodland management have also been important, particularly where there has been loss of open clearings and a reduction in the frequency of sizeable canopy gaps within modern high forest systems. Much broadleaf forest has slowly lost open rides that formerly catered for so many butterfly species. Nevertheless in recent years grant-aided woodland restoration schemes, such as those to restore coppice woodland, have helped to create more open space in woodland, benefiting butterflies such as the fritillaries.

Recent ecological studies of several species of butterfly have shown that egg-laying females are capable of conspecific discrimination between host plants. Many specialist species need suitable habitat containing the appropriate foodplant and the foodplant growing under the right set of biological and physical conditions to satisfy the evolutionary instincts of young larvae. For these 'fussy' species the chances of finding the right foodplant growing in the right set of conditions have been considerably reduced in recent decades. Agri-environment schemes and other incentives for habitat protection and management have improved the situation to some extent. However, the site manager now faces the difficult task of integrating management policies for a number of species that may have conflicting habitat requirements.

High Priority Butterflies

Adonis blue

- lack of grazing on calcareous grassland, including reduced grazing by rabbit populations following myxomatosis

SPECIES ACTION PLAN

Associated Hampshire Priority Habitats

The following Hampshire priority habitats contain areas of suitable habitat for priority butterfly species:

Ancient Semi-Natural Woodland
dingy skipper, Duke of Burgundy, grizzled skipper, marsh fritillary, pearl-bordered and small pearl-boarded fritillaries, purple emperor, white admiral, white-letter hairstreak

Coastal (maritime cliffs, dunes)
Glanville fritillary, grayling, grizzled skipper, wall

Heathland, Acid Grassland and Bog
grayling, marsh fritillary, pearl-bordered and small pearl-boarded fritillaries, silver-studded blue

Hedgerows
brown hairstreak, white-letter hairstreak

Lowland Calcareous Grassland
adonis blue, chalkhill blue, dingy skipper, Duke of Burgundy, grizzled skipper, marsh fritillary, small blue, wall

Lowland Wet Grassland
Marsh fritillary, small pearl-boarded fritillary

Neutral Grassland
marsh fritillary, small blue, wall

Pasture Wood and Parkland
dingy skipper, Duke of Burgundy, grizzled skipper, marsh fritillary, wall, white-letter hairstreak

Road Verges
dingy skipper, grizzled skipper, small blue, wall

- intrinsic low dispersal ability of this butterfly retarding recovery, especially in highly fragmented habitats that remain outside core areas of Dorset and Wiltshire
- management of calcareous grassland has to cater for the conflicting sward height levels required for the adonis blue and Duke of Burgundy – a management problem which has been exacerbated by fragmentation and reduction of suitable habitat.

Brown hairstreak

- loss of hedgerows and widespread annual flailing of existing hedgerows are major reasons for decline of this species
- over-zealous control of blackthorn scrub, neglect of blackthorn thickets, and reduction of blackthorn sucker growth by ploughing to field edges are contributory factors

Duke of Burgundy

- decline in coppicing has been a major factor in the loss of many suitable woodland sites
- inappropriate grazing regimes and over-zealous control of scrub have contributed to population declines on chalk grasslands

Glanville fritillary

- in stabilised cliff areas (such as produced by coastal protection schemes) foodplant succession is retarded by lack of regeneration of young plants

Grizzled skipper

- loss of coppicing and wide sunny rides in woodland
- unsuitable grazing regimes on calcareous grassland
- loss of roadside verges and inappropriate management of roadside verges

Marsh fritillary

- inappropriate management such as abandonment of light grazing by cattle or over-grazing by sheep

Pearl-bordered fritillary and small pearl-bordered fritillaries

- decline in coppicing and lack of continuity of sizeable felling of broad-leaved woodland.
- fragmentation of existing and potential habitats

Purple emperor

- loss and fragmentation of ancient broad-leaved woodland

Silver-spotted skipper

- unsuitable grazing regimes on calcareous grassland
- sites that rely on rabbit grazing are vulnerable as rabbit populations are unpredictable and difficult to control

Silver-studded blue

- populations decline as heathland management is neglected; mature heathers become unsuitable as larval foodplants
- habitat fragmentation (heaths of north east Hampshire)

Small blue

- increasing isolation of small populations exacerbates problems caused by the need for early successional vegetation
- dense rabbit populations consume larval foodplant flower heads

Medium Priority Butterflies

Chalkhill blue

- horseshoe vetch is very slow to re-colonise so existing sites should be carefully managed in order to maintain this foodplant

Dingy skipper

- habitat loss due to agricultural intensification, development of waste areas and cessation of coppicing in woodland

Grayling

- heathland colonies have been in decline for many years due to habitat loss from development, agricultural improvement and cessation of suitable grazing causing the invasion of coarse grasses and scrub

Wall

- reduction in area of unimproved grassland since the 1950s
- lack of cattle grazing on inland sites

White admiral

- fragmentation, erratic thinning, coniferisation and maturation of oak woodland

White-letter hairstreak

- populations were considerably reduced in the 1970s with the rapid spread of Dutch elm disease
- sucker growth from dead elms has been used as egg sites but it becomes re-infected when it reaches a height of 5 to 10 m.



2.4 Current Action

Butterfly Conservation is lead partner for UK Biodiversity Action Plan priority butterflies and the majority of priority moths. Many actions identified in UK SAPs are supported and carried out by volunteer members of Butterfly Conservation, the British Entomological and Natural History Society and Wildlife Trusts at a local level. The following projects represent a brief sample being carried out to conserve priority butterflies.

Butterfly Conservation published a leaflet on the management of hedgerows and woodland for the brown hairstreak in 1998.

Forestry Enterprise now considers Butterfly Species Action Plans when formulating Forest Design Plans.

Local

The marsh fritillary site in Bentley Wood is currently under management guidance from Butterfly Conservation and future plans include extension of suitable habitat.

At Martin Down the adonis blue breeds in a restricted area and this is managed by a controlled sheep-grazing regime.

The breeding habitat of the silver-spotted skipper was recently studied on Oxenbourne Down and Butser Hill by nature reserve staff and Butterfly Conservation volunteers.

Brown hairstreak egg counts in hedgerows in north-west Hampshire are regularly carried out by Butterfly Conservation volunteers.

Hampshire County Council adoption of patchy burning management at Broxhead Common Local Nature Reserve has helped to increase the resident silver-studded blue population.

The small blue colony at Percy Hobbs roundabout near Winchester receives special management by Hampshire County Council. Habitat restoration for this species has recently taken place at Magdalen Hill Down Local Nature Reserve and Morn Hill near Winchester. Habitat improvement has also taken place at Portsdown Hill and Porchester chalk pits with help from Portsmouth City Council, Fareham Borough Council and Butterfly Conservation.

Glanville fritillary sites on the Isle of Wight and Hampshire coastland are monitored annually with larval web counts in late summer and spring. Cliff maintenance prevents foodplant succession but the Isle of Wight Council has now developed a coastal defence policy that should allow the south-western coastline to erode naturally.

Restoration of pearl-bordered fritillary sites has been supported with Hampshire County Council grants for coppice restoration. Major enhancement of the habitat for this species in the Pignal and Ramnor Inclosure areas has recently taken place by the Forestry Commission.

The white letter hairstreak is receiving support in the Portsmouth area with an elm

**SPECIES
ACTION
PLAN**

National

Butterfly Conservation is currently completing the Marsh Fritillary Site Review Project based on data collected from 250 sites in the UK during 1999/2000. Butterfly Conservation have made a bid for European Life Nature Funds to support work on Salisbury Plain for the marsh fritillary.

Pearl-bordered fritillary habitat restoration was one of the aims of a recent initiative between Butterfly Conservation and Forestry Enterprise to re-introduce coppicing through the Woodland Improvement Grant Scheme. Butterfly Conservation conducted a national survey for the pearl-bordered fritillary in 1997-8 and the Butterfly Monitoring Scheme regularly targets this species.

Silver-spotted skipper sites were nationally surveyed between 1980-90 and showed a 30% increase in the number of occupied habitat patches in the North and South Downs. The Environmentally Sensitive Area (ESA) Scheme has recently helped to improve the breeding habitat of this species through the restoration of grazing on neglected downland.

Many chalkhill blue sites are benefiting from the ESA schemes and are monitored as Butterfly Monitoring Scheme sites or with Butterfly Conservation local branch transects. Although the ecology of the chalkhill blue is well known, the ecology of the foodplant horseshoe vetch in relation to grazing pressure is less well known and research is needed in this area.

Restoration of lowland heath is taking place in several regions and should benefit the grayling butterfly.

A 1994 survey of silver-studded blue sites in the Portland Bill area revealed 28 colonies and Dorset mapping schemes indicated a 30% increase in colonies during the last two decades.

planting initiative organised by Portsmouth City Council and Butterfly Conservation.

Habitat enhancement for the chalkhill blue has taken place on Portsdown Hill with the help of Portsmouth City Council and Butterfly Conservation. Chalkhill blue abundance has recently increased at Magdalen Hill Down Local Nature Reserve (1990/2000) following scrub clearance and introduction of grazing.

Hampshire Butterfly Conservation volunteers continue to survey all priority species and encourage site owners to improve habitat quality.

3 MACRO-MOTHS

3.1 Selection of Priority Species

The 1996 review²² of UK BAP high priority moth species, incorporated into the UK Biodiversity Programme in 1999^{23,24}, lists 54 species of macro-moths. Species selection criteria include factors involving recent population declines in the UK and Europe, proportion of UK resource in Europe, and UK distribution. Subsequently, 37 of these species were identified as regionally high priority species based on UK distribution (occurring in less than 15 ten km squares nationally), or having a regional stronghold of the total UK resource²⁵. Finally, 27 of these species were selected for inclusion in the Hampshire Butterflies and Moths SAP based on their presence in the county or in neighbouring counties close to the Hampshire border.

High Priority Macro-moth Species:

argent and sable *Rheumaptera hastata*
 barberry carpet *Pareulype berberata*
 barred tooth-striped *Trichopteryx polycommata*
 bordered gothic *Heliophobus reticulata*
 Brighton wainscot *Oria musculosa*
 buttoned snout *Hypena rostralis*
 chalk carpet *Scotopteryx bipunctaria*
 common fan-foot *Pechipogo strigilata*
 dark crimson underwing *Catocala sponsa*
 dingy mocha *Cyclophora pendularia*
 drab looper *Minoa murinata*
 heart moth *Dicycla oo*
 light crimson underwing *Catocala promissa*
 lunar yellow underwing *Noctua orbona*
 marbled clover *Heliolithis viriplaca*
 narrow-bordered bee hawk *Hemaris tityus*
 orange upperwing *Jodia croceago*
 pale shining brown *Polia bombycina*
 reddish buff *Acosmetia caliginosa*
 scarce merveille du jour *Moma aipium*
 shoulder-striped clover *Heliolithis maritima*
 southern chestnut *Agrochola haematidae*

speckled footman *Coscinia cribraria*
 striped lychnis *Shargacuculia lychnitis*
 the triangle *Heterogenea asella*
 white spot *Hadena albimacula*
 white-lined snout *Schrankia taenialis*

All 27 species are listed in the UK BAP as priority species or species of conservation concern. The following accounts of priority macro-moths are taken from Butterfly Conservation's Species Action Plans for Priority Species²⁶ and the recent Joint Nature Conservation Committee (JNCC) macro-lepidoptera review²⁷. Details of recent actions and surveys of all BAP butterflies and moths are reviewed in Butterfly Conservation's Lepidoptera Conservation Bulletins^{28, 29}. Additional accounts with identification guides of macro-moths may be found in books described in the Reference Section³⁰⁻³².

3.2 Current Status

Ecology and Habitat Requirements

Argent and sable

The argent and sable usually breeds in birch regrowth or birch coppice in woodland, and larvae feed on birches *Betula pendula* and bog myrtle *Myrica gale* (in boggy habitats). The argent and sable overwinters as pupae and the adult flies by day in warm sunny weather during the period May to July. The argent and sable is widespread throughout Europe including Spain, the Alps, and north Scandinavia. The species was widespread throughout most of Britain but has suffered a serious decline in the last 50 years and is now confined to a few sites mainly in southern England. Before 1975 Hampshire records of the argent and sable came from several sites including Botley Wood, Harewood Forest, wooded parts of the Itchen Valley, and the New Forest where it was common. The moth is now very rare in the county and absent from most of its previous strongholds. The only recent records are from Pamber Forest (1991-2000), Harewood Forest (1994-2000) and Micheldever Woods (2001).

Barberry carpet

The barberry carpet occurs in hedgerows and woodland margins where the larval foodplant, barberry species *Berberis vulgaris* and *B. turcomanica*, grows. Adults fly during the periods early May to mid-June and late July to August. The barberry carpet has been recorded from most European countries eastwards to Asia Minor and the Caucasus and reaches its northernmost limit in south-east Sweden. In the UK most colonies are in Wiltshire with one each in Gloucestershire and Dorset. In the 1970s the single well-established colony in Hampshire

was lost when the site was burnt during stubble burning.

Barred tooth-striped

The barred tooth-striped occurs in open parts of woodland and ride-edges on chalk, limestone or clay soils (with small pockets of lime), and on chalk downland where wild privet *Ligustrum vulgare*, the usual larval foodplant, grows in full sunlight. Adults fly between mid-March and late April. The barred tooth-striped occurs from western Europe through Russia to the Caucasus regions and from the northern part of central Scandinavia to the Alps. In Britain the moth is a widespread but local species. Current strongholds are Sussex, the North Hampshire and south Wiltshire area, the breckland on the Norfolk-Suffolk border and south Cumbria, with scattered colonies elsewhere. The barred tooth-striped was widespread in Hampshire in the 1950s, found on wild privet bushes in many open woodlands on chalk. The moth is now scarce and since 1980 records have come from only 3 sites – the Downs of Stockbridge, Martin and Broughton.

Buttoned snout

The buttoned snout is associated with hop *Humulus lupulus*, its single larval foodplant. The moth flies from August to early October when the adult hibernates in outbuildings, sheds and other man-made and natural cavities. It has been reported from every country in Europe except Ireland and was formerly widespread throughout southern Britain, north to Lincolnshire and south Wales. It has declined significantly and now occurs mainly in river valleys in south-east England, particularly the Thames basin, and on estuaries and other scattered sites around the coast of England. The buttoned snout is local and scarce in Hampshire. Recent records are mainly scattered throughout various southern areas of the county with the odd record from northern sites.

Chalk carpet

The chalk carpet occurs on chalk and limestone grasslands where their main habitats are short-grazed areas that have bare ground, including embankments, cliffs, quarries and sheep tracks. The moth flies during July and August. The larvae feed on bird's-foot trefoil *Lotus corniculatus* and other trefoils and clovers. The chalk carpet occurs throughout central and southern Europe to Asia Minor. In Britain the moth occurs on a limited number of calcareous sites in England and Wales, including the carboniferous limestone in north Derbyshire, the coastal chalk in Yorkshire, the chalk downs in southern England, and chalk and

magnesium limestone sites in Co. Durham. The chalk carpet has gone from many of its pre-1970 sites and the only recent records are from Old Winchester Hill and Broughton Down.

Common fan-foot

The common fan-foot is a moth of broadleaved woodland where larvae begin development on fresh or wilting foliage of oak and probably other trees and shrubs. They later prefer withered and decaying leaves on the tree or on the ground. The common fan-foot has been reported from almost every country in Europe except Albania, Greece, Crete and Turkey, but its current distribution in Europe is unclear. The moth formerly occurred throughout most of southern England and Wales, but it has declined greatly in recent decades and now survives in only a small number of oak-woods on heavy clay soils in the Midlands and central-southern England. This species was found throughout Hampshire in many deciduous woodlands up to the mid-1970s. In the last 20 years it has only been recorded at three sites: Pamber Forest, Spearywell Wood (Romsey) and Harewood Forest.

Dark crimson underwing and light crimson underwing

Both crimson underwings require large areas of mature oak woodland where larvae are dependent on oaks and fly in the period mid-July to early September. Both species are widely distributed throughout Europe where they are often local and rare. In the UK the dark crimson underwing had colonies in south Wiltshire and the London area but it is now confined to the New Forest. The light crimson underwing had colonies in Huntingdonshire, Buckinghamshire and Sussex until the late 1950s but it is now confined to the New Forest and a few woodlands in south Wiltshire.

Dingy mocha

The dingy mocha occurs on open boggy heathland where larvae feed on small-leaved sallows such as eared willow *Salix aurita* and grey sallow *S. cinerea*. The flight period is from May to early June, and July to early August. The dingy mocha occurs throughout Europe. In Britain it is a very local species confined to Dorset, where it occurs on the Purbeck heaths between Studland and Wareham, and western Hampshire. There are very few recent records of the dingy mocha and the Ringwood-Brockenhurst area of the New Forest remains its only known location in Hampshire.

Drab looper

Most if not all the breeding grounds of the drab looper are ancient woodland sites. The larvae feed on wood spurge *Euphorbia*

amygdaloides. Both the moth and the foodplant are associated with areas of recent felling and coppicing in woodland. Males fly in sunshine in the middle of the day. The drab looper is found throughout Europe where it prefers hilly and mountainous regions. In Britain it is found mainly in southern England (Hampshire, south Wiltshire, Berkshire and west Sussex) and an area that encompasses south-east Wales, Gloucestershire, Herefordshire and Worcestershire. In Hampshire the drab looper is locally common in several woodland sites throughout the county. During 1975-90 this diurnal moth was recorded in Sparsholt Woods, Harewood Forest, Pamber Forest and Bentley Wood where it was found to be fairly common in the early 1990s and remains widespread.

Heart moth

The heart moth is found in parkland and open woodland that contains widely spaced trees on the sides of woodland rides. Adults fly late June to July and larvae feed on oak and prefer over-mature trees. The heart moth has been reported from most countries in Europe, but is extinct, very rare or localised in many parts of its range that extends to the Middle East and the Urals. In Britain the New Forest was a favoured site for this species. However the moth is now extremely scarce in Hampshire with very few records over the last 50 years mainly from north-eastern parts of the county. Recent records are from Wheathold (1981), Wellington Country Park (1982), and Pamber Forest (1993).

Lunar yellow underwing

The lunar yellow underwing is now mainly associated with open sandy, heathy or calcareous sites and open grassy areas within woodland. Larvae feed on a range of fine grasses and small herbaceous plants and the flying period is late June to September. The lunar yellow underwing is a Mediterranean-Asiatic species, occurring locally throughout Europe with the exception of Ireland, the extreme south-west of Spain and Portugal, and southern Greece. The moth was formerly widespread in Britain but has been steadily declining. During the last 20 years it has been recorded from the Brecklands and other sandy sites in Lincolnshire, north Wales, north Northumberland and Fife; mudstone sites in Somerset and Leicestershire; clay sites in Essex; and calcareous sites in Dorset, south Wiltshire, north Hampshire, Bedfordshire and Pembrokeshire. The moth has declined in Hampshire over the last few decades and has been recorded from only one locality, Porton Down, during the last few years.

Marbled clover and shoulder-striped clover

The marbled clover and shoulder-striped clover moths are very similar in appearance and easily confused. The marbled clover is found in breckland, clover and lucerne fields, coastal areas and chalk downland, where larvae mainly feed on the flowers and seeds of white and bladder campion *Silene alba* and *S. vulgaris*. The shoulder-striped clover inhabits heathland where larvae normally feed on the flowers and seeds of heather and heaths *Erica* spp. and *Calluna vulgaris*. Both moths fly in June and July and are restricted to western Europe. In Britain, the marbled clover is established in the Breck district of Suffolk and Norfolk and less frequently in central southern and south eastern England. The shoulder-striped clover is found locally in the heathland areas of Dorset, Surrey and the New Forest in Hampshire. It is very occasionally recorded from chalk downland areas of Hampshire although it is possible these records are of immigrants. The shoulder-striped clover is confined to the New Forest and absent from north-eastern areas of Hampshire's heathland.

Narrow-bordered bee hawk

The narrow-bordered bee hawk-moth occurs on a wide range of unimproved grasslands, including wet, acidic grassland and chalk downland: it is also found on acid bogs, peat cuttings and drier heathland. Its larval foodplant is mainly devil's-bit scabious *Succisa pratensis* and adults fly from mid-May to mid-June. The narrow-bordered bee hawk occurs locally across the western Palaearctic, with records from virtually every country in Europe. The moth is widespread in the UK but extremely local. Formerly local and moderately common in Hampshire, the narrow-bordered bee hawk is now extremely scarce in the county. The most recent records of the moth have come from scattered chalk grassland localities in north Hampshire.

Pale shining brown

The main habitat of the pale shining brown is scrubby grassland on light calcareous soils. The pale shining brown has been recorded from almost every country in Europe. In the UK it formerly occurred widely in England, mainly south of a line between the Severn and the Humber, but it has declined substantially with records from about 20 scattered sites since 1980, only a few of which have strong colonies. Once locally common in Hampshire before the 1970s, the pale shining brown is now extremely scarce. The moth is present at Porton Down and was regularly recorded at Bentley Wood in the early 1990s with fewer records in recent years, although still recorded in 2001. The



moth was recorded at Overton and Tadley in the early 1980s.

Reddish buff moth

The reddish buff feeds solely on the leaves of saw-wort *Serratula tinctoria*, which is normally found in weakly acid to weakly basic grassland in woodland clearings and heaths. The moth flies from mid-May to late June and has a very local but scattered distribution in Europe, which extends eastwards into Asia. In Britain this species has always been extremely local and was confined to Hampshire and the Isle of Wight in the early 1990s. However, it is now extinct in Hampshire and the only remaining native population is found in the Isle of Wight.

Scarce merveille du jour

The scarce merveille du jour is associated with large pedunculate and sessile oak trees *Quercus robur* and *Q. petraea* in mature woodland. It is thought that the egg is laid and larvae feed in the tree canopy. The moth is widely distributed in Europe as far north as Sweden. Current British strongholds are in Wiltshire, Hampshire and West Sussex, with colonies in East Sussex, Kent, Cornwall and Devon. The New Forest remains its favoured locality in Hampshire although it is still present in woods near Wickham and in Havant Thicket. The moth disappeared from the Chandlers Ford area where it was fairly common until the early 1950s. Recent records have come from woodland north and east of the New Forest.

Southern chestnut

The southern chestnut is distributed throughout the western Mediterranean. It was discovered for the first time in Britain in 1990 in west Sussex, subsequently in the New Forest (1996), and more recently in Dorset. The moth is found on extensive dry acid heathland, where larvae have been found feeding nocturnally on the flowers of bell heather *Erica cinerea* and cross-leaved heath *E. tetralix*. The moth flies from September to early November. In Hampshire the moth was first discovered in the New Forest (Linford) in 1996 although it has been suggested that the moth had been present in previous years but overlooked due to its late flight period. In recent years the moth has been found in additional areas of the New Forest including Sopley Common (2000), Picket Hill (1997), Dur Hill (1997) Whitemoor (1997) and Picket Post (1997).

Striped lychnis

The striped lychnis is found in a variety of weakly calcareous habitats associated with its main larval foodplant, dark mullein *Verbascum nigrum*. It is most frequently seen on roadside verges and railway embankments, fields that have recently been

left fallow, and in woodland rides and clearings. The long flight period extends from May to early August. The striped lychnis occurs in most European countries from the Mediterranean to Denmark and southern Sweden. The range extends to central Asia, the Caucasus, the Urals and Russia. Its British range has declined greatly within the last 25 years during which it has been lost from half of its former range, including all of Wiltshire, Dorset, Surrey, East Anglia and Gloucestershire. Thirty years ago the striped lychnis was locally common and scattered over most areas of Hampshire. Now, it is largely restricted to an area of central Hampshire where it is mainly found a temporary colonist on disturbed ground such as roadsides. Recent records have come from Kings Somborne (1995), Crawley (1995 and 1999), Magdalen Hill Down (1995), South Wonston (1993-95), and Selborne (1995). In 2000 the moth was discovered to have colonised the recently re-seeded extension of the Magdalen Hill Down Reserve near Winchester.

The triangle

The triangle occurs in semi-natural broadleaf woodland and flies from mid-June to late July. The larval foodplants are oak *Quercus* spp. and beech *Fagus sylvatica*. The triangle ranges from France to southern Fennoscandia and Russia. In Britain, the moth has always been confined to southern England where it is very local and scarce. It occurs in a few woods mainly in Sussex, Kent and Hampshire. Most Hampshire records come from the New Forest where it is now scarce. Recent records include Alice Holt Forest, Chandlers Ford, the New Forest and Bentley Wood on the border with Wiltshire.

White-lined snout

The white-lined snout occurs in a wide variety of habitats from open moorland and hedgebanks to both acidic and calcareous woodland. The moth is a Eurasiatic species which occurs in western and central Europe through to southern Turkey, Transcaucasia, Israel and Korea. Between 1960 and 1983 this species was recorded locally in Britain south of the Wash, from Cornwall to Kent, as far north as Cambridgeshire in the east and Gloucestershire in the west, and from south Wales. Since 1980 the moth has been recorded at additional sites in south Wales but only at a scattering of about thirty sites throughout the rest of its former range. It is not known if this reflects a genuine decline or simply lack of systematic recording of this obscure species. It is very local and uncommon in Hampshire. Most recent records have come from southern areas of the county: Brockenhurst (1985), Ladycross (1999), Beaulieu (1996), Southwick (1996),

Botley Wood (1998) and Titchfield Haven (1996).

White spot

The white spot is a moth of shingle or calcareous cliffs and the larvae feed on the seed capsules of Nottingham catchfly *Silene nutans*. Flight is in late May to mid-July. The white spot has been reported from every country in Europe except Ireland, Luxembourg, Albania and the island of Malta, and the range extends to western Siberia, Iran and Morocco. In the UK single populations are known at Dungeness (Kent), the Dorset coast, Sidmouth (Devon) and Browndown near Gosport in Hampshire.

Speckled footman, bordered gothic, orange upperwing, Brighton wainscot

These four moth species have only been recorded occasionally in Hampshire over the last few decades, which casts doubt on existing viable populations. However, future survey work may establish their true status in Hampshire. Old Hampshire records of bordered gothic came from calcareous grassland sites. Similar records for the orange upperwing moth came from oak woodland, and the last county records of the Brighton wainscot moth, which feeds on cereal crops, came from northern areas of the county. The speckled footman and the Brighton wainscot are found on the wing from July to August, while the bordered gothic has a shorter flight period of June to July. The orange upperwing appears in October and November before hibernating, after which the adult is found from late March to early May.

Associated Hampshire Priority Habitats

The following Hampshire priority habitats contain areas of suitable habitat for priority macro-moth species:

Ancient Semi-Natural Woodland

argent and sable, barberry carpet, barred tooth-striped, common fan-foot, dark crimson and light crimson underwing, drab looper, heart moth, lunar yellow underwing, orange upperwing, reddish buff, scarce merveille du jour, triangle, white-lined snout

Arable

Brighton wainscot

Coastal (maritime cliffs, dunes)

marbled clover, bordered gothic, buttoned snout, white spot

Heathland, Acid Grassland and Bog

dingy mocha, shoulder-striped clover, narrow-bordered bee hawk, southern chestnut, white-lined snout, speckled footman

Hedgerows

barberry carpet, barred tooth-striped, buttoned snout, striped lychnis, white-lined snout

Lowland Calcareous Grassland

barred tooth-striped, bordered gothic, Brighton wainscot, chalk carpet, lunar yellow underwing, marbled clover, narrow-bordered bee hawk, pale shining brown, speckled footman, striped lychnis

Lowland Wet Grassland

narrow-bordered bee hawk

Neutral Grassland

buttoned snout, narrow-bordered bee hawk, pale shining brown

Pasture Wood and Parkland

heart moth

Road Verges

striped lychnis

Urban (disused quarries, gardens, railway embankments, cuttings)

buttoned snout, chalk carpet, striped lychnis



3.3 Current Factors Affecting Priority Macro-moth Species

In general, the same environmental factors influencing butterfly populations affect moths in a similar way. Nectar resource is important for some moths but not all. Only three priority moth species – argent and sable, narrow-bordered bee hawk and drab looper – are purely diurnal and require a similar nectar resource to butterflies. However, overwintering moths in the adult stage often indulge in a nutrient boost by nectaring on plants such as ivy bloom in autumn and willow catkins in spring.

Like butterflies, many moth species often display con-specific host discrimination, which may explain the demise of several priority species following the loss of habitat variation. Former forestry policy of planting conifers in place of broadleaf trees has reduced many moth populations over the last 50 years, and the recent reversal of this policy will help to rectify this situation. However, the ecology of many priority moth species is poorly known and research and increased survey work is necessary to clarify these issues.

Argent and sable

The argent and sable in southern England has suffered from the loss of birch regeneration on the edge of woods and rides in modern high forest systems. This has

largely resulted from the decline of coppicing and other active woodland management in the lowlands.

Barberry carpet

For many decades barberry carpet colonies have been lost due to widespread grubbing out of *Berberis*, a host of wheat-rust fungus *Puccinia graminis*. General hedgerow removal and effects of mechanised trimming since the 1940s have probably resulted in further losses along with uncontrolled stubble burning, vandalism and road developments. Re-planting barberry in suitable locations together with appropriate management may help to restore this species.

Barred tooth-striped

The barred tooth-striped has declined through loss of suitable habitat in chalk woodlands by 'cleaning up' activities, unsympathetic ride management, hedge removal and the clearance of wild privet during road works. Scrub clearance, ploughing or development on downland and other rough bushy places have also damaged or destroyed known colonies. Shading and crowding out of privet by natural succession to woodland may also be a threat.

Buttoned snout

Hop is a plant of hedgerows and thickets rather than dense woodland. It often grows around human habitation where it is probably an escape from past cultivation. Redevelopment of derelict urban sites and over-tidying of footpaths and recreational areas may have contributed to the decline of the buttoned snout in certain areas.

Chalk carpet

Inappropriate grazing management on calcareous grassland often produces an unsuitable, over-dense, tall sward for the chalk carpet. The moth prefers short swards with bare ground so sites must not be allowed to become rank and grazing may be necessary. Bird's-foot trefoil can be encouraged by heavy grazing followed by a release from grazing for a year or two on a rotational basis. Banks and landslips are used by this species and should not all be fenced off and allowed to become rank or invaded with scrub.

Common fan-foot

The common fan-foot's main threats have yet to be defined. The replacement of broadleaf woodland by conifers, cessation of coppicing and the lack of natural regeneration of oaks are possible causes.

Dark crimson underwing and light crimson underwing

The fragmentation of large blocks of woodland and felling of mature oak woodland are believed to be responsible for the decline of these two crimson underwing moths.

Dingy mocha

The main threat for the dingy mocha is the loss of suitable heathland habitat to development, forestry and extensive fires. There is a danger that the 1 to 3m tall sallow bushes on which this moth breeds might be cleared during well-intentioned heathland restoration programmes.

Drab looper

As an open-woodland species, the major threats for the drab looper have been the decline in coppicing and the lack of wide sunny rides and glades in woodland.

Heart moth

The main threats to the heart moth are not well known, but loss of key oak trees, re-planting and lack of natural regeneration are possible reasons.

Lunar yellow underwing

The precise cause of the widespread decline of this species is unknown although the loss of habitat through agricultural intensification is thought to have contributed.

Marbled clover and shoulder-striped clover

The marbled clover's decline in Hampshire since the 1950s is probably due to the ploughing of downland slopes and the loss of clover fields. The shoulder-striped clover is subject to the common heathland threats of fire and encroachment of habitat.

Narrow-bordered bee hawk

Agricultural improvement by drainage, ploughing and application of fertilisers destroyed much of the bee hawk's available habitat since the 1940s. The grass component of the sward must be kept from out-competing the broadleaved herbs on which the larvae feed and the adults take nectar. Urban and suburban development on riverside meadows is another threat. The change from traditional hay-making to silage production has been proposed as a cause of decline in Ireland and mid-summer cutting may be harmful to feeding larvae.

Pale shining brown

The reasons for the rapid decline of this species are unknown. It is considered not to be solely associated with loss of suitable habitat.

Reddish buff moth

The reddish buff moth's main threat has been habitat fragmentation and the establishment of conifer plantations on open heathland and in woodland. Excessive scrub encroachment in open woodland due to inadequate management is also a problem. The moth requires the early successional stages of a mosaic of native vegetation created by periodic small-scale clearances and grazing.

Scarce merveille du jour

Large-scale felling and replanting of oak woodland with conifers remains the main threat for the scarce merveille du jour, although its ecology is poorly known.

Southern chestnut

As the southern chestnut is a heathland species, it is threatened by the common heathland problems of uncontrolled burning, encroachment of conifers and development.

Striped lychnis

The principal threat for the striped lychnis is the loss of the foodplant dark mullein. Ground disturbance from mowing and other activities is essential for foodplant regeneration, but this should be planned so that it does not affect the whole of any colony in any one year in order that larvae complete development and plants set seed. Untimely mowing of roadside verges often destroys feeding larvae. Any cutting in the spring should be before the first flower spikes appear and before mid-May. Nevertheless plants usually recover from cutting or grazing and send up a second growth of flowering spikes that may be used by some late larvae. Cutting or grazing in July and August should be avoided where this does not conflict with road safety, but cutting of verges containing *V. nigrum* should be undertaken at least biennially in September/October to prevent sites becoming too rank and colonised by scrub, and to scatter seeds. On a positive note, additional habitat has been created in recent years by set-aside, woodland management and other activities.

The triangle

The triangle's main threats include the loss of mature broadleaf woodland predominated by oak and beech.

White-lined snout

Possible causes for decline are unknown due to a lack of knowledge of their ecology.

White spot

Recreation, small-scale coastal developments, coastal defence work and the commercial extraction of shingle, gravel and sand are the main threats to the white spot.

Speckled footman, bordered gothic, orange upperwing, Brighton wainscot

Current factors affecting these four species are not fully understood as knowledge of their ecology is incomplete.

3.4 Current Action

Butterfly Conservation is the lead partner for UK Biodiversity Action Plan priority butterflies and the majority of priority moths. Many actions identified in UK species action plans are supported and carried out by volunteer members of Butterfly Conservation, the British Entomological and Natural History Society and Wildlife Trusts at a local level. The following projects represent a brief sample being carried out to conserve priority moths.

National

The argent and sable has been a component of the Forestry Commission (FC) Coppice for Butterflies Challenge scheme and Butterfly Conservation (BC) surveys for the moth have taken place in various parts of southern England including Savernake Forest in Wiltshire.

The drab looper has also been a component of the FC Coppice for Butterflies Challenge scheme and BC surveys for the moth have taken place in various parts of southern England including Savernake Forest and Heaven's Gate Park in Wiltshire. BC have targeted this species in field meetings at Bentley Wood and Pamber Forest, and local BC members continue to survey potential Hampshire sites.

A captive breeding programme and trials to establish new colonies of barberry carpet are underway in Dorset and Wiltshire as part of an English Nature recovery programme. The moth has bred for two generations unassisted at one trial site.

A striped lychnis national survey was undertaken in 1991 for the Joint Nature Conservation Council. Buckinghamshire County Council has funded surveys and modified cutting regimes on sections of roadside verge for this species.

English Nature are producing a leaflet on buttoned snout aimed at site owners, managers and local councils.

BC and the British Entomological and Natural History Society carried out a survey of the Brighton wainscot on Salisbury Plain in 2001. Only 3 moths were found during several survey nights.



BC has recently introduced a UK Biodiversity Action Plan Priority Moths Email Newsletter. The aim is primarily to encourage recording of the UK Biodiversity Action Plan priority moths.

Local

English Nature have funded surveys for the dingy mocha in the New Forest and areas of Dorset (2000) and core areas for the moth are being identified. BC have recommended to the FC that surveys continue together with management research. A leaflet aimed at site owners and managers is in preparation by EN and an EU Life Fund application for monitoring the dingy mocha in the New Forest has been made.

Hampshire Wildlife Trust (HWT) initiated studies into larval ecology of the chalk carpet and the barred tooth-striped at Broughton Down in 2000. Larval searches for the latter species have proved more productive than adult trapping sessions.

HWT and Butterfly Conservation (Hampshire Branch) have initiated a joint programme of surveying and monitoring for larvae of the striped lychnis.

BC recently commissioned a study of the status and distribution of buttoned snout in south Hampshire.

In the early 1990s an English Nature Species Recovery Project was initiated to restore former localities of the reddish buff on the Isle of Wight and to re-establish the moth on the British mainland through a single site in Hampshire.

A regular larval survey of the white spot is carried out at Browndown.

A detailed description of ecological and distribution data for each of the 53 priority species, similar to that given in the butterfly and macro-moth sections above, is beyond the scope of this document. Indeed, there is little known field ecology for many of the species, due to their rarity and lack of survey work. Names and brief details of the selected micro-moths have been summarised in a Table 2.

4.2 Current Status

In general, priority micro-moths favour similar habitats to macro-moths and butterflies. However, habitats such as buildings and gardens are more important for micro-moths due to their biology and ecology. Also, Hampshire's coastal features such as saltmarsh, shingle and sand dunes are important habitats for several species of micro-moths, some of which are extremely vulnerable. Grazing on coastal marshes has declined over the last few decades although there has been a recent revival in some coastal areas. Some of these important coastal sites are now being used for gravel and sand extraction followed by landfill. Such activities can adversely change the water table causing the loss of essential moth foodplants. The grassland habitats listed in Table 2 generally refer to unimproved or semi-improved grassland, a diminishing feature of the landscape largely due to agricultural policies during recent decades.

The majority of butterfly and macro-moth larvae feed externally on their foodplants. Many micro-moth larvae, probably due to their relatively small size, feed internally, especially in their early stages. A variety of internal feeding methods – such as boring, case making, galls and mines – occur. External feeders often construct silken tubes and spin leaves together for protection from predators. Pupation can take place in the larval habitation for very small larvae or in a wide range of alternative places similar to macro-moth behaviour.

Identification of micro-moths can be a problem for the novice. There is no simple single identification guide covering all species, and members of some families can only be distinguished by genitalia inspection, although the appearance of mines and general larval feeding damage may help. Site managers are recommended to encourage the help of local experienced lepidopterists. More detailed accounts of micro-moths can be found in several books and papers³³⁻⁴¹ and the recent publication by Goater and Norris⁴² indicates the most up-to-date records and locations of both micro- and macro-moths in Hampshire.

SPECIES ACTION PLAN

4 MICRO-MOTHS

4.1 Selection of Priority Species

Over 300 micro-moth species were provisionally listed as holding regionally high and medium priority status in Butterfly Conservation's South-central Regional Action Plan³³. A total of 53 species have been selected for inclusion in this Hampshire Butterflies and Moths SAP on the basis of their rarity status being "Notable" or higher (defined as nationally scarce and recorded from 100 or less 10 km squares in Britain since 1980). A few species with a lower status that have suffered a recent decline in Hampshire have also been added to the list.

Table 2 Hampshire's Priority Micro-moths

Family	Species	UK Distribution	No. of Sites in Hants ¹	Habitat	Foodplant	Hampshire sites ²
NEPTICULIDAE	<i>Ectoedemia agrimoniae</i>	SE England	3	Dry pastures, calcareous grassland	Agrimony <i>Agrimonia eupatorium</i>	Botley Wood, Portsdown Hill, Horsea Island (1980s)
NEPTICULIDAE	<i>Ectoedemia spinosella</i>	S England	1	Coastal	Blackthorn <i>Prunus spinosa</i>	Christchurch (1973)
NEPTICULIDAE	<i>Ectoedemia erythrognella</i>	S England	10+	Coastal	Bramble <i>Rubus fruticosus</i>	Browndown, Portsea Is, Horsea Is, Hayling Is, Portsdown Hill (1980s).
NEPTICULIDAE	<i>Trifurcula beirnei</i>	SE, C, N England	1	Dry pastures, waste ground	Dyer's greenweed <i>Genista tinctoria?</i>	Southsea (2000)
NEPTICULIDAE	<i>Trifurcula eurema</i>	Widespread	6	Calcareous grassland	Trefoil <i>Lotus spp.</i>	Botley Wood (1976), Leckford (1986)
NEPTICULIDAE	<i>Stigmella aceris</i>	SE England	1	Woodland, gardens, parks	Maple <i>Acer spp.</i>	Winchester (1985)
NEPTICULIDAE	<i>Enteucha acetosae</i>	Widespread	2	Wide range	Sorrel spp., <i>Rumex spp.</i>	Longmoor (1975)
INCURVARIIDAE	<i>Lampronia flavimitrella</i>	SE England	1	Gardens, parks, orchards	Bramble <i>Rubus fruticosus</i> agg.	Itchen Abbas (1974)
PSYCHIDAE	<i>Epichnopteryx retiella</i>	SE England	3	Coastal - saltmarshes	Grasses, esp. <i>Puccinellia maritima</i>	Hayling Island (1986)
PSYCHIDAE	<i>Pachythelia villosella</i>	Dorset, Hampshire	3+	Acid heathland	Heather <i>Calluna spp.</i> , Heath <i>Erica spp.</i> , grasses	New Forest only: Beaulieu Road (1979), Matley Bog (1986)
GRACILLARIIDAE	<i>Caloptilia falconipennella</i>	SE, C, N England	3+	Marshes, river banks, ditches	Alder <i>Alnus glutinosa</i>	Matley Bog (1983)
GRACILLARIIDAE	<i>Caloptilia hauderi</i>	Hants, IOW	1	Woodland	Field maple <i>Acer campestre</i>	St Helens is established site
GRACILLARIIDAE	<i>Acrocercops imperialella</i>	S, N England	1	Damp woodland, marshes	Comfrey <i>Symphytum spp.</i> , Lungwort <i>Pulmonaria spp.</i>	Pre-1950 record
YPONOMEUTIDAE	<i>Argyresthia abdominalis</i>	SE England, Scotland	3+	Calcareous grassland	Juniper <i>Juniperus communis</i> leaves & twigs	Leckford, Stockbridge Down, Porton Down (1980s)
YPONOMEUTIDAE	<i>Yponomeuta irrorella</i>	Hants, Kent	1	Calcareous woodland	Spindle <i>Euonymus europaeus</i>	Abbotstone Down (1963), Highcliffe
YPONOMEUTIDAE	<i>Digitivalva perlepidella</i>	S, C England	1	Calcareous grassland	Ploughman's-spikenard <i>Inula conyza</i>	Ashford Hangers
YPONOMEUTIDAE	<i>Acrolepiopsis marcidella</i>	Hampshire	10+	Dry woodland	Butcher's broom <i>Ruscus aculeatus</i>	Widespread (Wickham)
COLEOPHORIDAE	<i>Coleophora ahenella</i>	S England	3+	Calcareous grassland	Buckthorn <i>Rhamnus cartharticus</i>	Sparsholt (1984), Chillbolton (1982)
COLEOPHORIDAE	<i>Coleophora ramosella</i>	Hants, Kent	1	Calcareous woodland	Daisy <i>Bellis spp.</i> , golden-rod <i>Solidago spp.</i>	Chillbolton Down (1966)
COLEOPHORIDAE	<i>Coleophora aestuariella</i>	SE England	1	Coastal - salt marshes	Annual sea blite <i>Suaeda maritima</i>	Hayling Island
ELACHISTIDAE	<i>Elachista littoricola</i>	Hampshire	1	Coastal	Common couch <i>Agropyron repens</i>	Hurst Castle foreshore - vulnerable
OECOPHORIDAE	<i>Esperia oliviella</i>	S, C England	2	Ancient woodland	Dead wood, standing or cut	Harewood Forest (1981), Crab Wood
OECOPHORIDAE	<i>Oecophora bractella</i>	Eng, Wales	1	Woodland	Under bark of standing dead trees	Harewood Forest (1980s)
OECOPHORIDAE	<i>Depressaria albipunctella</i>	Eng, Wales	1	Dry pastures	Wild carrot <i>Daucus spp.</i> Hedge parsley <i>Torilis spp.</i>	(Serious UK decline since 1970s)

Family	Species	UK Distribution	No. of Sites in Hants ¹	Habitat	Foodplant	Hampshire sites ²
OECOPHORIDAE	<i>Depressaria olerella</i>	SE Eng, Scotland	1	Dry grassland	Yarrow <i>Achillea millefolium</i>	Longmoor (1986)
GELECHIIDAE	<i>Monochroa moyses</i>	SE England	5	Coastal - tidal ditches, estuarine marshes	Sea club-rush <i>Bolboschoenus maritimus</i>	Farlington Marshes, Hilsea L., Sandy Point NR, Hayling Island (1990s).
GELECHIIDAE	<i>Coleotechnites piceaella</i>	SE England	1	Coniferous woodland	Norway spruce <i>Picea abies</i>	Winchester area (1980s)
GELECHIIDAE	<i>Scrobipalpula tussilaginis</i>	S England	1	Coastal-cliffs	Colt's-foot <i>Tussilago farfara</i>	West Hampshire coast
MOMPHIDAE	<i>Mompha jurassicella</i>	S, C Eng	1	Dry pastures, river banks	Great willowherb <i>Epilobium hirsutum</i> stem	Cams Bay (Fareham)-vulnerable site
COSMOPTERIGIDAE	<i>Cosmopterix orichalcea</i>	Widespread	1	Damp pastures, marshes	Reed canary-grass <i>Phalaris arundinacea</i>	Leckford (1987)
COSMOPTERIGIDAE	<i>Cosmopterix scribaiella</i>	Hampshire	7	Marshes	Common Reed <i>Phragmites communis</i>	Portsmouth, Fareham, Gosport
COSMOPTERIGIDAE	<i>Dystebenna stephensi</i>	S, N England	1	Woodland	Oak <i>Quercus</i> spp, in bark of mature trees	New Forest (Whitley Wood, Brockenhurst)
COSMOPTERIGIDAE	<i>Sorhagenia rhamniella</i>	SE England	2	Calcareous woodland margins	Buckthorn, alder buckthorn, <i>Rhamnus catharticus</i> , <i>Frangula alnus</i> , flowers, shoots, buds	Winchester area, Abbotstone Down (1990s)
TORTRICIDAE	<i>Acleris lorquiniana</i>	S England	1	Marshes	Purple loosestrife <i>Lythrum salicaria</i>	Browndown Marsh (1985)
TORTRICIDAE	<i>Endothenia pullana</i>	Widespread	1	Marshes	Marsh woundwort <i>Stachys palustris</i>	Leckford area (1986)
TORTRICIDAE	<i>Bactra lacteana</i>	Hampshire	1	Damp pastures, marshes	Sedge spp <i>Carex</i> spp	Plaitford Common
TORTRICIDAE	<i>Epinotia subsequana</i>	S, C Eng, Wales	2	Woodland, gardens, parks	Grand fir <i>Abies grandis</i>	Parnholt Wood, Havant Thicket
TORTRICIDAE	<i>Eucosma metzneriana</i>	SE England	1	Calcareous grassland	Mugwort <i>Artemisia vulgaris</i>	Southsea (1982)
TORTRICIDAE	<i>Pammene trauniana</i>	S England	3+	Woodland	Field maple <i>Acer campestre</i>	Botley Wood (1976-77)
TORTRICIDAE	<i>Cydia medicaginis</i>	Hampshire, Essex	1	Waste ground	Lucerne <i>Medicago sativa</i>	Southampton area (1989)
TORTRICIDAE	<i>Cydia pactolana</i>	SE England	2	Coniferous woodland	Norway spruce <i>Picea abies</i> bark	Botley Wood (1976-85)
TORTRICIDAE	<i>Cydia illutana</i>	Hampshire	1	Woodland	Larch cones <i>Larix</i> spp.	Southsea (1975)
PYRALIDAE	<i>Crambus silvella</i>	S, N Eng, Wales	1	Bogs, marshes	Sedges <i>Carex</i> spp	New Forest
PYRALIDAE	<i>Platytes alpinella</i>	England	3+	Coastal - sand dunes, shingle beaches	Mosses <i>Tortula</i> spp	Possible migrant

Butterflies and Moths

PYRALIDAE	<i>Evergestis limbata</i>	Hampshire	1	Woodland	Cruciferae spp, <i>Genista tinctoria</i>	Hayling Island (2000)
PYRALIDAE	<i>Cynaeda dentalis</i>	S England	2	Coastal, calcareous grassland	Viper's bugloss <i>Echium vulgare</i> stem, petioles	Portsdown Hill (1970s), Hayling Island
PYRALIDAE	<i>Paratalanta pandalis</i>	S, C Eng, Wales	1	Calcareous woodland	<i>Origanum, Solidago spp.</i>	Sparsholt, Pitt Down, Oxenbourne Down, Crawley (1970s & 80s)
PYRALIDAE	<i>Sclerocona acutellus</i>	Hampshire	1	Marshes	Common Reed <i>Phragmites australis</i>	Leckford area
PYRALIDAE	<i>Psammotis pulveralis</i>	Hampshire	1	Marshes	Water mint <i>Mentha aquatica</i> , Gipsywort <i>Lycopus europaeus</i>	Matley Bog (1995)
PYRALIDAE	<i>Nascia ciliaris</i>	Widespread	3+	Marshes	Sedges <i>Carex spp, Cladium</i>	Crab Wood (1989)
PYRALIDAE	<i>Mecyna flavalis</i>	S England	3+	Calcareous grassland	<i>Urtica, Artemisia, Galium spp</i>	Leckford (1988), Micheldever (1973), Porton Down (1990s), Winterslow (2000)
PTEROPHORIDAE	<i>Buckleria paludum</i>	S, N Eng, Wales	1	Marshes	Sundew <i>Drosera rotundifolia</i>	New Forest
PTEROPHORIDAE	<i>Cnaemidophorus rhododactyla</i>	SE England	1	Woodland	Dog rose <i>Rosa canina</i> stem shoot and bud	Botley Wood (1977)

Key

1 Approximate number of Hampshire sites from recent records

2 Hampshire sites with most recent year of last record where known

5 OBJECTIVES

The overall aim of this Plan is to protect and increase the distribution and populations of all priority species of butterflies and moths in Hampshire. This broad aim translates into the specific objectives set out below. The 'Proposed Action' table in section 6 identifies the action to be taken to meet these objectives.

**SPECIES
ACTION
PLAN**

	OBJECTIVE	PROPOSED ACTIONS
A	Arrest the decline of butterflies and moths in Hampshire and expand their populations and ranges, with special emphasis on priority species	1 - 26
B	Improve knowledge of the ecology of priority butterflies and moths through survey, research and monitoring	27 - 41
C	Promote communication, education and awareness of the status and needs of priority butterflies and moths in Hampshire	42 - 46

6 PROPOSED ACTION

The following table lists the actions required to achieve the objectives set out in section 5 of this Plan. Each action has been assigned to one or more 'Key Partners'. Key Partners are those organisations that are expected to take responsibility for the delivery of the actions assigned to them, according to the targets set in this Plan. Other organisations may also be involved in the delivery of action, and they are indicated in the 'Others' column of the table.

Key to symbols in Action Table:

- ◆ To be completed by the indicated year. Work can commence at any time before the due date, at the discretion of the Key Partner.
- ◆⇒ Design or production of a plan/strategy to be completed by this year and then followed by its implementation.
- ➔ To start by the indicated year and usually followed by ongoing work. A start arrow in year 2002 can indicate a new action or a new impetus to existing work.
- ⇨ Work that has already begun and is ongoing.

**SPECIES
ACTION
PLAN**

	ACTION	PRIORITY SPECIES	DELIVERY BY		YEAR						MEETS OBJ.		
			Key Partner	Others	◆ = complete by	◆⇒ = design by and implement	➔ = start by	⇨ = ongoing	2002	2003		2004	2005
Sites and Species Protection and Conservation Strategies													
1	Ensure that the long-term protection of priority species of butterflies and moths is taken into account in forward planning and development control.	ALL	LAs	BC EN HWT	➔								A
2	Promote beneficial grassland management in areas where priority Lepidoptera exist, concentrating on strategic meta-populations, which include some large populations or where there are extensive networks of habitats.	SB AB SSS DB PSB CC +	BC EN FWAG HCC HWT	DEFRA	➔								A
3	Restore suitable habitats within former range, by scrub removal and reinstatement of appropriate grazing regimes, concentrating on areas within 10-20 km of existing populations where natural re-colonisation is most likely to occur.	SB AB SSS DB +	BC EN FWAG HCC HWT	DEFRA	➔								A
4	Encourage protection, restoration and management of all sites and large potential habitats within the post-1940 range through management agreements and site acquisition where relevant.	ALL	EN FWAG HCC	DEFRA	➔								A

Butterflies and Moths

	ACTION	PRIORITY SPECIES	DELIVERY BY		YEAR						MEETS OBJ.	
			Key Partner	Others	2002	2003	2004	2005	2006	2010		
Sites and Species Protection and Conservation Strategies (cont'd)												
5	Allow for habitat requirements of all priority species in management regimes in ESAs and other agri-environment schemes (e.g. Countryside Stewardship, Reserves Enhancement Scheme) for existing colonies and potential colonies.	ALL	BC DEFRA	EN HWT FWAG		◆						A
6	Ensure management of calcareous grassland integrates the varying habitat requirements of all relevant species of flora and fauna, characteristic of medium, short and sparse turf heights.	SB AB SSS DB CC PSB LYU +	BC EN	HCC HWT		◆⇒						A
7	Encourage coppice restoration and active broad-leaved woodland management throughout the region, particularly that which will maintain large populations or networks of populations across the region.	PBF SPBF MF DB AS DL +	BC FC HCC	HWT	⇨	⇨	⇨	⇨	⇨	⇨	⇨	A
8	Implement suitable management to protect extant and, where possible, extend roadside colonies of priority species.	SB SL	BC HCC	DC HWT	➔							A
9	Assess the feasibility of strategic re-introductions.	PBF SPBF MF DB +	BC EN	HCC HWT			◆					A
10	Encourage restoration of suitable breeding habitat within former sites, where there is potential for re-establishing viable networks of populations.	ALL	BC FC	DEFRA FWAG HCC HWT	➔							A
11	Advise conservation agencies and site owners/managers on the location of occupied and other suitable (but unoccupied) sites and on practical habitat management and how to incorporate this with other management priorities and interests.	ALL	BC EN	FWAG HCC HWT DEFRA	⇨	⇨	⇨	⇨	⇨	⇨	⇨	A
Site and Species Management												
12	Encourage landowners to increase the size and frequency of canopy gaps, rides and clearings in woodland.	PBF SPBF MF DB AS DL +	BC FC FE	EN FWAG	➔							A
13	Encourage appropriate bracken, scrub and grazing management.	MF PBF SPBF DB +	BC HCC	EN FWAG DEFRA			◆					A

**SPECIES
ACTION
PLAN**

Butterflies and Moths

14	Encourage suitable integrated and rotational grazing management on calcareous grassland.	AB SSS SB DB +	BC EN HCC	FWAG DEFRA				◆			A
15	Maintain important sites and habitats of the coastline.	GF WS Micro-moths	BC EN HCC		⇒	⇒	⇒	⇒	⇒	⇒	A
16	Encourage the growth of <i>Viola</i> spp. in clearings and ride margins.	PBF SPBF	BC FC FE	HWT HCC FWAG	⇒	⇒	⇒	⇒	⇒	⇒	A
17	Encourage the growth of <i>Primula</i> spp. in woodland and downland.	DB	BC FC FE	DEFRA FWAG HCC HWT	⇒	⇒	⇒	⇒	⇒	⇒	A
18	Encourage the growth and age range of <i>Salix</i> spp. at suitable locations.	PE +	BC FC FE	DEFRA FWAG HCC HWT	⇒	⇒	⇒	⇒	⇒	⇒	A
19	Encourage the growth of oaks by replanting or natural regeneration.	Micro-moths DCU LCU +	BC FC FE	HCC HWT FWAG	⇒	⇒	⇒	⇒	⇒	⇒	A
20	Encourage the growth of calcicolous flora by suitable management.	SB AB SSS DB CC PSB LYU +	BC EN	FWAG HCC HWT DEFRA	⇒	⇒	⇒	⇒	⇒	⇒	A
21	Encourage the growth of suitable nectar sources in open areas.	ALL	BC	HWT FWAG	⇒	⇒	⇒	⇒	⇒	⇒	A
22	Encourage site owners to establish box junctions, scalloping and other features to improve the quality of woodland rides.	ALL	BC FC FE HCC	HWT FWAG						◆	A
23	Encourage age diversity of timber and appropriate thinning management in plantation woodland.	ALL	FC FE	HCC FWAG	⇒	⇒	⇒	⇒	⇒	⇒	A
24	Where several species colonise the same site, advise site owners on suitable discriminatory management that improves the habitat for all species.	PBF SPBF MF DB SB AB SSS +	BC	EN	➡						A
25	Ensure that site owners and contractors receive appropriate advice on the correct methods of implementation of conservation management tasks.	ALL	BC EN HCC HWT FWAG		➡						A
26	Advise site owners on the availability of stock for grazing regimes.	PBF SPBF MF DB SB AB SSS +	BC EN HCC	HWT FWAG	⇒	⇒	⇒	⇒	⇒	⇒	A

**SPECIES
ACTION
PLAN**

Butterflies and Moths

	ACTION	PRIORITY SPECIES	DELIVERY BY		YEAR						MEETS OBJ.	
			Key Partner	Others	2002	2003	2004	2005	2006	2010		
<p>◆ = complete by ◆⇒ = design by and implement ⇒ = start by ⇔ = ongoing</p>												
Survey, Research and Monitoring												
27	Establish monitoring techniques on priority species sites appropriate to species ecology. E.g., assess the suitability of transect, egg count or other monitoring methods for appropriate species.	ALL	BC	BENHS HCC		⇒						B
28	Encourage private site owners to allow access for monitoring.	ALL	BC HCC FWAG		⇔	⇔	⇔	⇔	⇔	⇔	⇔	B
29	Advise site managers on monitoring techniques.	ALL	BC HCC	FWAG	⇔	⇔	⇔	⇔	⇔	⇔	⇔	B
30	Establish Priority Species Co-ordinators to help with co-ordination of monitoring and surveying work and recruitment of volunteer workers.	ALL	BC	HWT BENHS	⇒							B
31	Collate annual records, transect data and compare trends on individual sites.	ALL	BC HCC	BENHS		⇒						B
32	Investigate dispersal ability, the effect of habitat loss and isolation of colonies on population viability.	ALL	BC EN ITE	U	⇔	⇔	⇔	⇔	⇔	⇔	⇔	B
33	Establish reasons for the loss or decline of priority butterflies and moths in Hampshire.	ALL	BC EN ITE				◆					B
34	Conduct research on parasitoids and other species associated with the same habitat.	PBF SPBF MF +	BC EN ITE	HWT U		⇒						B
35	Conduct further research on ecology and management regimes in woodland and on scrub, grassland edge habitat.	DB BCM NBBH PSB WLS +	BC EN ITE	HWT				◆				B
36	Monitor rabbit populations at calcareous grassland sites where rabbits are the sole or main grazing animals.	SB AB SSS DB +	BC	EN HCC	⇒							B
37	Conduct further research on appropriate management regimes and species ecology on chalk and limestone downland.	SB AB SSS DB NBBH PSB +	BC EN ITE U	HWT							◆	B
38	Encourage and investigate the creation of new habitat from thin soil slopes, which have been ploughed (e.g. ex-farmland and set aside), especially close to existing colonies.	SB AB SSS DB +	BC EN ITE	HWT HCC							◆	B
39	Determine size of populations and identify locations of all colonies in rapid decline.	ALL	BC			◆						B

**SPECIES
ACTION
PLAN**

Butterflies and Moths

40	Identify potentially suitable, unoccupied habitats in former range greater than 20 km from existing populations.	PBF SPBF MF	BC	HCC		➔					B
41	Identify potentially suitable, unoccupied habitats within 10-20 km of existing populations.	PBF SPBF MF	BC	HCC		➔					B
Communication, Awareness and Promotion											
42	Publicise HCC BAP and measures needed to conserve species including the use of all forms of media and communications.	ALL	BC HCC HWT			➔					C
43	Ensure that forums promoting the implementation of HAPs, such as the Lowland Calcareous Grasslands HAP Group, are aware of this Action Plan and any subsequent actions to conserve priority species.	ALL	HCC	HWT		➔					C
44	Ensure monitoring and management data is readily accessible to site owners.	ALL	BC EN HCC			➔					C
45	Encourage the use of newsletters, web sites and public open days to promote conservation of priority species.	ALL	BC HCC	HWT EN			➔				C
46	Maintain close liaison with BC HQ and Hampshire Branch BC.	ALL	BC HCC	HWT EN		➔					C

**SPECIES
ACTION
PLAN**

KEY TO PRIORITY SPECIES

AB adonis blue
AS argent and sable moth
CC chalk carpet moth
DB Duke of Burgundy fritillary
DCU dark crimson underwing moth
DL drab looper moth
LYU lunar yellow underwing moth
LCU light crimson underwing moth
MF marsh fritillary
NBBM narrow-bordered bee hawk moth
PBF pearl-bordered fritillary
PE purple emperor
PSB pale shining brown moth
SB small blue
SL striped lychnis moth
SPBF small pearl-bordered fritillary
SSS silver-spotted skipper
WLS white-lined snout moth
WS white spot moth
+ other species, especially moths, will also benefit from the action

KEY TO ORGANISATIONS:

BC Butterfly Conservation (Hampshire Branch and Headquarters)
BENHS British Entomological and Natural History Society
DC District and borough councils
DEFRA Department for Environment, Food and Rural Affairs
EA Environment Agency
EN English Nature
FE Forest Enterprise
FC Forestry Commission
FWAG Farming and Wildlife Advisory Group
HCC Hampshire County Council
HWT Hampshire Wildlife Trust
ITE Institute of Terrestrial Ecology
LAs Local Authorities (All)
U Universities

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**SPECIES
ACTION
PLAN**

This is one of many Habitat, Species and Topic Action Plans being prepared by the Hampshire Biodiversity Partnership. It will be monitored by the Partnership and fully reviewed and updated in 2007.

This Species Action Plan has been prepared by Barry Fox on behalf of the Hampshire Biodiversity Partnership.

For further information contact: Andy Barker, Hampshire County Council,
Tel: 01962 846858, e-mail: andrew.barker@hants.gov.uk